DOCUMENT RESUME

ED 191 046 CS 205 764

AUTHOR Crow, Wendell C.
TITLE From Nominal to Quantitative Codification of Content-Neutral Variables in Graphics Research: The Beginnings of a Manifest Content Model.
PUB DATE Aug 80
NOTE 32p.: Paper presented at the Annual Meeting of the Association for Education in Journalism (63rd, Boston, MA, August 9-13, 1980).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Graphic Arts: *Layout (Publications): *Measurement Objectives: *Media Research: Models: Photocomposition: Predictor Variables: Printing: Publishing Industry: *Research Design: Research Methodology: *Research Needs: Research Problems
IDENTIFIERS *Typography

ABSTRACT

This paper suggests ways in which manifest, physical attributes of graphic elements can be described and measured. It also proposes a preliminary conceptual model that accounts for the readily apparent, measurable variables in a visual message. The graphic elements that are described include format, typeface, and photographs/artwork. The measurements of these elements that are used in the conceptual model focus on such format variables as (1) total page area, width-to-depth ratio, design-grid size and increment, general parameters, and specific parameters: (2) typographic features such as size, weight, force of stress, presence of serifs, and texture: and (3) features of photographs and artwork, including total area, width-to-depth ratio, density, recession/advancement, lines of force, projection level, hue, value, and chroma. Visual and formulaic representations of the conceptual model are offered, with suggestions for dependent variables (reading interest, reading difficulty, aesthetic appreciation, preference, attitude change, and efficiency). (RL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED191046

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Graphics Division

FROM NOMINAL TO QUANTITATIVE CODIFICATION OF CONTENT-NEUTRAL VARIABLES IN GRAPHICS RESEARCH

The Beginnings of a Manifest Content Model

By

Wendell C. Crow
Associate Professor

Department of Communications
California State University, Fullerton
Fullerton, California 92634
Phone 714-773-3517

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Wendell C. Crow

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Presented to the Graphics Division,
Association for Education in Journalism Annual
Convention, Boston, Mass., August 1980

CS205764

FROM NOMINAL TO QUANTITATIVE CODIFICATION OF CONTENT-NEUTRAL VARIABLES IN GRAPHICS RESEARCH

The Beginnings of a Manifest Content Model

Introduction

> Theory and process, definition and exercise stand side by side . . . one aspect without the other cannot lead to the development of methodologies to achieve a new channel of communication, which can ultimately, like writing, expand the means for human interaction (Dondis 1973).

One of the frustrations facing those who would seek to understand relationships between graphic communications and their effects is the dearth of laws, theoretical models or even fundamental principles upon which to draw. Frustration is common among behavioral scientists navigating seas of imprecision in search of tiny islands of truth. However, it seems especially severe in those wishing to study effects on readers of the images on a printed page.

Visual communications research is complicated by the nature of the researchers and their material. These investigators may hold genuine, subjective affection for their variables. A prominent typographer/author has suggested we "make friends with"

certain classic typefaces (Lieberman 1967). In another case, a major printing industry magazine's recent cover glows with Forrest Dale Forbes' poem eulogizing the "generous fonts of honest Caslon type, Saxon heart in romans and italic . . ." to be found "under a Printer's Heaven" (Printing Impressions, Dec., 1979).

Many graphics researchers, too, hold kinship through study and experience with graphic designers who are today ". . . challenged by batteries of machines equipped with insatiable appetites for highly structured form and repeatable patterns, when all of their design training and most of their experience has favored innovation and the unexpected" (Hurlburt 1978).

The graphics researcher is a stranger neither to intellectual nor practical reasons for inquiry which have historically concerned the scientific enterprise (Selltiz and Jahoda 1959). Hardly a field of knowledge exists that is expected to produce more tangible results--psychological, instructional or economic--than that of graphics. Public relations practitioners, magazine editors and advertising directors all know the high expectations of those who pay for "good graphics." Clients and vice presidents simply want their money's worth.

In a field where some consider it heresy even to consider measuring its elements, a surprising amount of meaningful research is accomplished. Still, it seems that not nearly enough can be stated with precision about the effects of graphic communications. Rules of design, statements about type usage, axioms concerning

psychological effects of color--all seem to warrant endless qualification. In an area that is, many would argue, more akin to art than science wide variations in approach and philosophy must be expected. However, it seems that currert research now suffers from a lack of synthesis with related research and with theoretical foundation. Our technological wizardry long ago outstripped our ability to explain visual phenomena adequately.

Solid foundations exist, much of them in the literature of applied psychology. Our understanding of human perception and information theory is remarkable. Yet, the gap between theory and practical application still seems extraordinarily wide.

One possible handicap that can be eliminated in graphics research is the absence of clear codification of what might be termed "manifest" (readily perceived or understood) graphic elements or variables. While numerous general classification taxonomies exist regarding type, pictures, art and other graphic units, no integrated system, let alone model, is available to help researchers account for such variables. This paper suggests ways in which manifest, physical attributes of graphic elements can be described and measured. It also proposes a preliminary conceptual model which accounts for readily apparent and measurable variables.

A Review of Current Taxonomies

No unified system of variable description is reflected in graphics research today. However, this does not mean that resear-

chers, writers, designers and artists have not attempted to describe and classify visual information for aesthetic value and practical use. Indeed, an overview of a few of these attempts at organizing and quantifying is appropriate here to illustrate that, perhaps, many elements of an integrated system are already in place.

Precise definition of visual elements is not new. Construction of elegant Greek temples was guided by the "Golden Mean." It called for "bisecting a square and using the diagonal of one half of the square as a radius to extend the dimensions of the square to become a 'Golden Rectangle'" (Dondis 1973). Leonardo da Vinci's meticulously detailed drawings are classic examples of scale and proportion. The French Academie Royale des Sciences in 1692 developed a new typeface for the Imprimerie Royale based upon a network of 2304 squares (Zapf 1968). Organization of space in page design sprang from Japanese concepts of double square proportioning, which influenced works of Mondrian and other artists and architechs of the de Stijl movement early in this century (Hurlburt 1976).

Today a number of systems exist to describe or classify visual elements. Dondis describes the "tool box" of basic elements in visual communications--the dot, the line, shape, direction, tone, color, texture, scale or proportion, dimension, and expressed or implied motion (1973). He also summarizes the techniques that can be used with these elements in seeking visual solutions. These twenty terms and their antonyms--many based on Gestalt principles of perception--are contrast-harmony, instability-

balance, asymmetry-symmetry, irregularity-regularity, complexity-simplicity, fragmentation-unity, intricacy-economy, exaggeration-understatement, spontaneity-predictability, activeness-stasis, boldness-sublety, accent-neutrality, transparency-opacity, variation-consistency, distortion-accuracy, depth-flatness, juxtaposition-singularity, randomness-sequentiality, sharpness-diffusion, and episodicity-repetition (1973).

The visual field--in plainer language, the paper page area--in publications graphics is defined by format parameters. These parameters begin with standard page sizes, some having evolved from historical accident rather than through scientific logic. Page areas are then usually broken up, perhaps somewhat arbitrarily, into marginal (uncolumned) and intramarginal (columned) space. Superimposed on the general column/margin plan are the printed images--type, borders, art, and photographs--separated or framed by white (negative) space, and intercolumned space. An infinite number of image versus nonimage combinations seems possible to the researcher. However, no accepted procedure exists for guiding and organizing examination of such combinations. Researchers are forced to use highly general, subjective criteria ("abundant white space, eye-catching photos")(Suskind 1979) when examining graphic elements.

Type, the key symbolic element in graphic communications, is becoming increasingly more difficult to study systematically. Hundreds of new faces are designed each year (or pirated because of poor copyright protection), joining the tens of thousands of functional typefaces already in existence. Many type classifica-

tion systems have been developed. Of these, one is based on serifs alone; another, known as "Gee Whiz," is founded solely on the letter G (or g).

One of the most elaborate and historically sensitive classification systems has been proposed by J. Ben Lieberman (1967). His Typorama lists no fewer than two primary divisions, nine categories, 30 classes and 100 styles.

Most type classification taxonomies seem to sacrifice precision for utility, with only limited success. Researchers, understandably impatient with the lack of a widely adopted system, end up studying limited numbers of typefaces or typesetting modes in relative isolation, in the tradition of Tinker (1963) or Hvistendahl (1965). Researchers such as Tannenbaum, et al. (1964) and Wrolstad (1960), have probed the connotations and reader preferences for type. However, civilization's ability to produce new type designs will continue to outstrip our ability to study them unless a uniform method is found for studying common characteristics rather than individual faces.

Printed photographs and art present even more research difficulty because of the complexity of meaning represented by each separate image. Valuable attempts have been made to identify the nature of photographs through studies of their perceptual bases (Gibson 1954), their value as cues and reinforcers in learning (Gropper 1963), and Hochberg 1962), their attention-getting power (Swanson 1955), their aid in comprehension (Culbertson 1968), attitude changing power (Mehling 1959), and relations to reader preferences (Woodburn 1947)--to name but a few. Very little study

has been done of perhaps the most obvious elements of photographs, their manifest content, or the totality of their shapes, sizes, tones, colors and suggested motion--with William Hazard's study of pictorial shapes and organization a notable exception (1960).

As with type, no shortage of photographic taxonomies exists. Photographs are classified as fine art versus photojournalism, or in categories such as crime-corruption, accident-disaster, sports, human interest, and the like (Schramm 1949), with each student and author applying somewhat different labels and meanings. Once the researcher gets beyond general labels, however--black and white or color, vertical or horizontal, cropped or full frame--he finds few useful ways to describe universal characteristics of images.

In studying nonphotographic art or illustrations, one finds virtually the same situation. One encounters labels suggesting the nature of the work (terms like abstract or stylized), and citing the medium used to produce it (perhaps wash, charcoal, or pencil). Photographs reproduced to resemble art are given names like line conversion, mezzotint or steel engraved.

With photographs and other nontypographic images, it appears that efforts to find communalities that are empirically useful have not yet produced an heuristic model of pictorial effects.

This is not to deny arguments that "good" graphic communications happen. even when we can neither label them well nor fully understand why they produce the effects they do. What one may legitimately question, however, is whether or not even the

most evident characteristics of graphic elements have been adequately quantified or systematically studied.

Toward Improved Precision in Defining Variables

In order that one might suggest a system or model which accounts for physically measurable manifest variables, it may first be necessary to demonstrate that some of the variables discussed previously at the nominal level are, indeed, subject to higher orders of measurement. It will be seen that most such variables can be expressed as highly reliable, continuous values, primarily relating to area, density and direction.

Format

With regard to page sizes, formats and image versus non-image areas, it is useful to envision the entire visual plane as one or more rectangular fields which can be expressed as combinations of width-to-depth ratios, total areas and lineal increments. Systems using CAD (computer-aided design), modular area composition and grid displays are already a reality for modern publications. These systems depend upon programmed formats which identify exact size and position of each graphic element in relation to all others.

Hurlburt (1978) illustrates the immense potential the design grid offers in establishing predictable patterns of placement in graphic design:

> The vertical lines of a grid will control the inner and outer margins, define the type columns, and determine the space separating them . . . . The horizontal lines . . . will determine the head and foot margins, the depth of the type column, and the location of the headlines and visual material . . . . The grid assumes its most important design function when the vertical and horizontal lines combine to produce the squares or rectangles that form a blueprint for the printed page.

Hurlburt explains the master grids of nearly a score of well known, highly innovative publications, including the London Sunday Times, the New York Herald, the Minneapolis Tribune, Time magazine, and the Random House Encyclopedia. The flexibility of grids is demonstrated by the Herald's six-unit (column) grid divided into 102 double-square rectangles versus Homelife magazine's simple two-unit grid with twelve rectangles.

While Hurlburt's major theme is that of explaining the grid concept and showing its importance to production by computer, his examples seem to lead to a natural extension of the grid--to that of research applications.

The simple but elegant grid (Figure 1), designed by Lisa Ponti and Giovanni Fraschioni for the Italian magazine Domus, is a four-unit, 24-rectangle page plan. It divides a commonly used page size of approximately 8½ x 11 inches into simple areas and ratios of space, in addition to marginal space and space between columns (Figure 2). Many possibilities exist for placement of type and photographs. Figure 3 indicates a layout where width-to-depth ratios and the precise percentage of page space each photograph covers if all page space is accounted for are given.

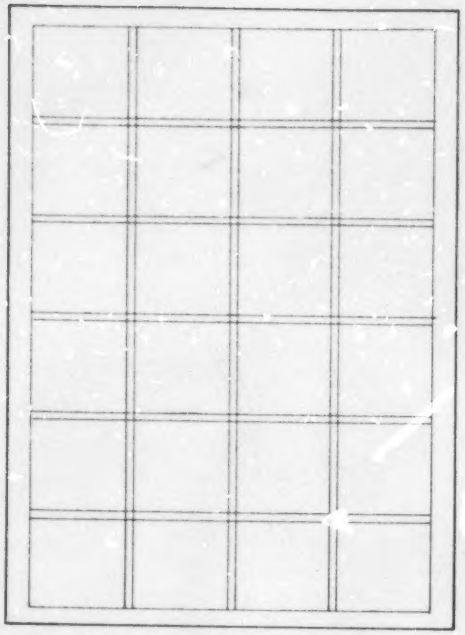


Fig. 1. The Domus grid, divided into a four-unit, 24-rectangle page plan.

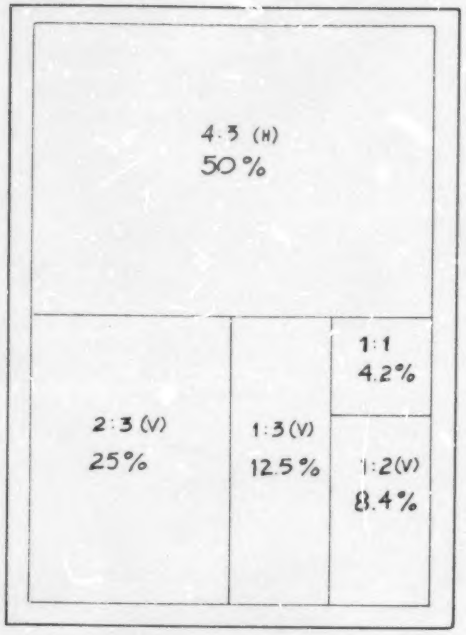


Fig. 2. Simple ratios of width to depth and area percentages of selected rectangles on the Domus grid. Note that margin space and space between grid rectangles is ignored here.

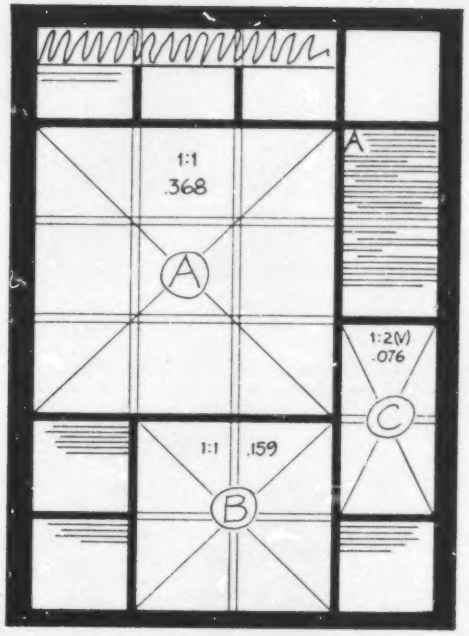
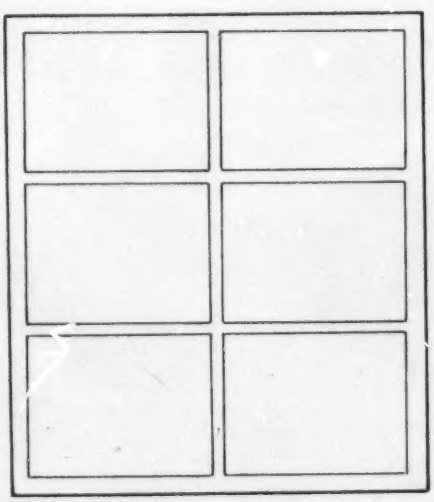


Fig. 3. A layout on the Domus grid, with width-to-depth ratios and area percentages listed for photographs. Area percentages indicate the exact percentage of the total page area (including margins and space between grid rectangles) each photograph covers.

Should researchers adopt a number of standardized grids for research purposes, ones that offer the widest range of area, ratio and placement possibilities, results from a large number of studies could be more easily compared.

Figure 4 shows two additional grids mentioned by Hurlburt --one simple, one complex--which might serve as standard research grids.



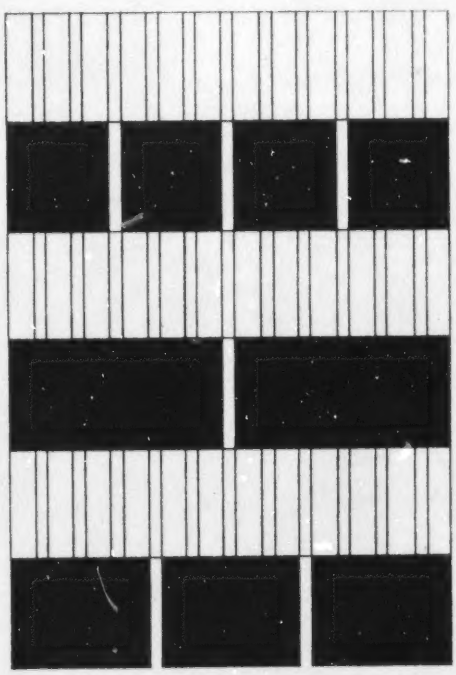


Fig. 4. The grid above allows six possible rectangles for placement of graphic elements. The grid to the right offers a 12-unit, 72-rectangle choice for placement, easily divisible for 2-, 3-, and 4-column formats. This grid would accommodate many of today's magazine formats.

With grid standardization, instead of studies describing the effects of "a big, horizontal picture in the upper left-hand corner of the page," one might reasonably expect the specificity of "a photograph of 3:2 ratio, covering an area defined by grid intersections A,D,L,N, constituting .237 percent of the area of Standardized Grid #5.

Typographic Elements

New methods to describe type empirically are needed today. No agreement seems forthcoming between manufacturers, authors and users of type regarding anything but nominal styles (roman, gothic, or novelty, for example), characteristics (bold, extended or oblique, perhaps), and, of course, fonts (such as Bodoni, Serif Gothic, or American Typewriter). The closest numerical agreement, at least in the U.S., is on a century-old point system of measurement which is relatively functional. However, since many sophisticated computer typesetting systems today offer half-point size increments, the system seems to be in danger of losing much of its comparative utility. Of course, "bigness" of type is highly relative to page size anyway (a 30-point headline is large for Reader's Digest, small for Life).

When one considers the thousands of typefaces in existence, the many designed and lens-or digitally-modified weights and forms possible for each, and the intricate array of potential point sizes, sets, and horizontal and vertical point or unit adjustments, the problem of cohesion in research findings becomes frightening. It is evident that ways must be found to reduce these data to manage-

able form.

A beginning would be to determine which variable characteristics of type forms are meaningful in most research applications. As sociologists do not need to know every personality quirk of subjects in a study of housing migration, we probably do not need to know all aspects of a letterform to study important characteristics it may have in common with a class of others.

Lieberman (1967) noted at least 18 possible variable elements in types--basic shape, proportion, weight, distribution of stress, quality of line, treatment of endings, stance, strokes, dimensions, inter-shape variation, width, inter-character contrast, force of stress, contour, surface treatment, alignment, special characters, and size.

Should researchers work to isolate but a few of the most prominent of characteristics for standardization, a more universal system, at least for research purposes, would emerge. One might find, for example, that only the combination of size relative to total page area, density relative to type area, stance, and presence or absence of serifs were necessary to predict behavior regarding most type applications. These variable characteristics of type are relatively easy to measure and do not depend upon knowledge of specific type classifications for meaning.

Figure 5 shows the results of measuring only one prominent variable, density relative to type area. Samples of five common typefaces--Franklin Gothic, American Text, News Gothic, Goudy Bold, and Bodoni Bold--are given, all producing an identical phrase in 72-point size. The three-digit number to the lower right of each

sample shows the actual percentage of total space in each rectangle the letter images cover. For example, the phrase set in Franklin Gothic has a density ratio of .516, indicating its letters cover a much greater percentage of the rectangular area needed to spell out the phrase than do the letters in Bodoni Bold, which has a density ratio of only .348. This measurement of the physical area the letters cover detects great density differences between five types of equal point size. It also shows great similarity between types of vastly different races (News Gothic, .385, and Goudy Bold, .376). Of course, the types obviously differ in x-height, stress and general design. What is so useful about the density ratio is that it presents these differences in a single number.

Figure 6 gives results of measuring another prominent variable characteristic of type, stance. Three Italic fonts--Bodoni Bold, Contact Bold Condensed, and Caslon, No. 540--were measured for stance angle (deviation from baseline perpendicular). Measures show that the two roman typefaces are highly dissimilar in stance angle, 12½ degrees versus 22 degrees. While stance angle differences are not surprising to anyone even passingly familiar with type, use of such angles for research comparison may be.

Both the above measures of type suggest that manifest, physical attributes of type, such as density and stance, may prove helpful in adding precision to type comparisons where descriptive terms often have prevailed.

With regard to body types, which because of their small sizes present problems in measurement, a simple value of typographic

Fig. 5

Franklin Gothic .516

American Text .489

News Gothic .385

Goudy Bold .376

Bodoni Bold .348

Fig. 6

Bodoni Bold Italic | Contact Bold Condensed Italic | Caslon #540 Italic

texture may suffice. Such texture is usually cited as the density or color (monochromatic tones) of a column or mass of type rather than single letters or lines. Visual comparison with a gray scale will yield an estimated density value.

In a program of systematic typographic research, types no longer would necessarily have to be referred to only by family names and point sizes. "Personalities" of types are not accounted for in the above mentioned quantifying systems. However, prior research suggests that types can be grouped or factored along connotative dimensions (Benton 1979, for example), and such attributes could be controlled for in experiments. In most typographic studies it would seem valuable for one to study what range or class of types would be most appropriate for the message, not specifically which typefaces.

Photographs and Art

As with other graphic elements, photographs and art seem to have defied quantification to a great extent. However, we should be reminded that such reduction of images to numerical data has become commonplace in publications technology today, and

probably will continue. The system used by U.S. News & World Report of scanning pages and recording the information digitally employs a Model 3600 Illustration Scanner and records each photograph scan on magnetic tape. It is capable of reproducing a scale of 256 discrete shades (Turnbull and Baird 1980). The Laserphoto machine is an important tool in most newsrooms, and readily affordable pagination and area composing devices are capable of producing rules, borders and type wraps. All of these depend upon breaking image tones into small bits of information.

Reflection densitometer readings of equidistantly intersecting points on a grid (perhaps at ¼" intervals), superimposed on a photograph would reveal patterns formed by the variable densities of photographic images. These density values normally are converted to a wide range of dot percentages in the halftone process of production. Visual estimation of printed dot sizes will yield similar tonal scale approximations. Figures 7, 8, and 9 & 10 suggest several ways photographic tonalities might affect syntactical eye movement in page layout.

Densities of line art, borders, and any other noncontinuous-tone images also are readily described in percentage values corresponding to the mechanical screen tint (or Ben Day) dot sizes used to print them.

Data points in four-color process images could be described simply in terms of dot percentages of each of the pigment primaries present at the precise measurement point. By using a color evaluation device such as the Pantone Four Color Process Guide, one

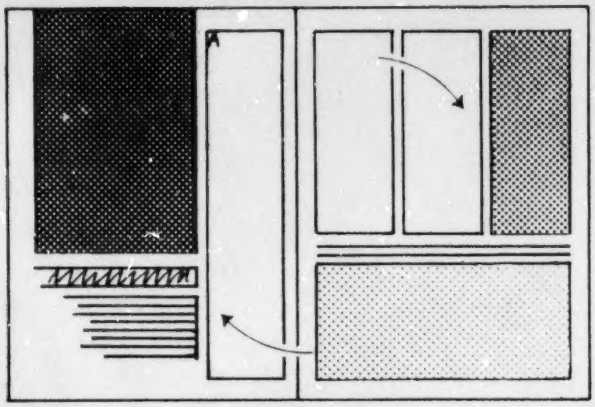


Fig. 8. This double-page magazine spread shows a rotation of photographic tones from dark to light. Such rotation would encourage eye movement in roughly the directions indicated. Such horizontal/vertical/reversed horizontal often is seen as a desirable eye movement pattern for magagine spreads.

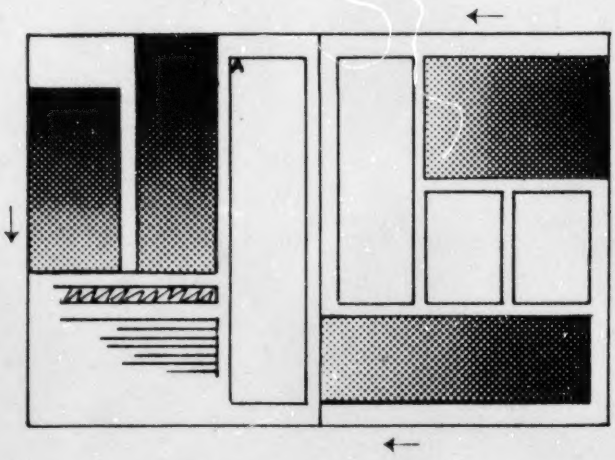


Fig. 9. An alternative eye movement pattern, again suggested only by photographic tones, is one that points to the beginning of the story from all directions. Note that the dark-to-light tones are within each photograph in this illustration.

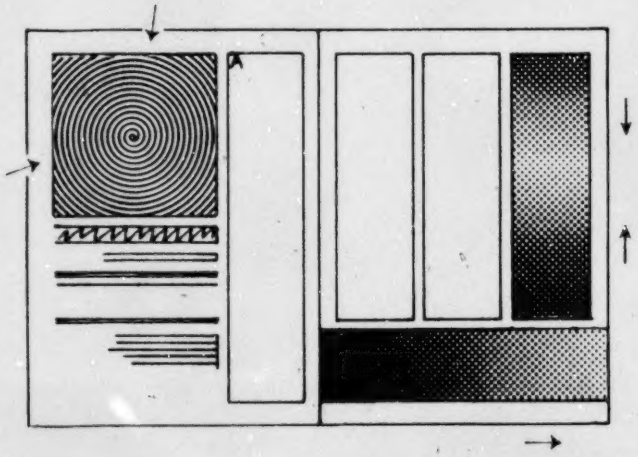


Fig. 10. This layout indicates the disruptive effects of tonal direction. In the upper left is a photograph of monochromatic tone but which, through strong internal lines of force pulls the eye constantly toward it. Both photographs on the right contain tonal directions which draw the eye away from the beginning of the story.

is able to determine that, for instance, a particular green tone printed on a page actually is made up of 80 percent yellow, 30 percent red, 70 percent blue, and 10 percent black dots. This suggests that all areas of process images are defined by four values--in other words, each possible point in the image would contain four percentage scores. By thus describing printed color not by hues, values and intensities, but by mechanical formulae, a researcher might lend precision to investigations of the meanings of predominant hues, color balance, and other effects.

Other measures of color may be possible. The Munsell System of color identification seems to offer promise, as it establishes distinct scales for measuring hue, value, and chroma. (Strauss 1967).

Any number of relationships between printed images and layout might be examined if precise color description was used. For example, psychological studies have suggested that colors can be designated either warm (advancing) or cool (receding) (Turnbull and Baird 1980). Figure 11 indicates this phenomenon. By establishing a scale for an advancement/recession continuum, linked to precise data indicating dot sizes forming predominant hue, value or intensity, one might be able to determine the degree to which color affects both two- and three-dimensional perceptions as the eye moves across the page. Among the wide range of possible effects of interest would be the associative, retentive and aesthetic powers of multiple colors in modern printing.

Photographs and art, then, can be described not only in shapes, width-to-depth ratios and areas, but in varying combinations or averages of monochromatic or full color attributes for research purposes. Of course, all of these descriptions are in addition to the very powerful information concerning photographic subject matter which we would naturally bring to bear.

A number of problems in physical measurement would be encountered. For one thing, printing papers neither reflect light nor absorb ink uniformly, two factors that affect ink color and density. Also, screen tint effects vary according to line coarsity (a 50 percent dot pattern in a 65-line screen tint produces a much different visual texture at average reading distance than that of a 200-line tint. However, these and other problems

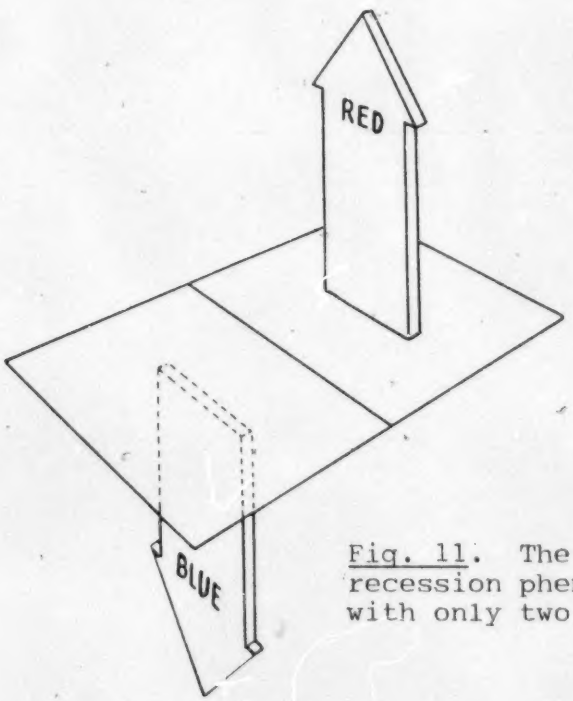


Fig. 11. The advancement/recession phenomenon illustrated with only two primary colors.

could be overcome in the effort by researchers to produce a uniform method for discussing the tonalities of images.

Another characteristic of photographs and illustrations that is subject to measurement is the image's "line of force," or the direction in which it points and leads the eye toward or away from other elements in a layout. A photograph of a person facing toward the camera seems to be neutral in eye-directing force, whereas a person looking dramatically to the right seems to draw our eye in the direction he is looking. Lines of force are reinforced by tonalities or gradual shifts from dark to light or receding to advancing color, coupled with other direction-implying elements. These effects are used continually by designers to provide visual syntax and appropriate eye movement from image to image. Figures 12 and 13 illustrate how even a simple line drawing can be described in terms of force lines that imply action and direct eye movement.

Lines of force in nonphotographic drawings, illustrations, graphs and other art are related to the nature of the view or projection selected by the artist or image generator. Engineers working with computer graphics technology are able to convert large amounts of data into pictures using automatic plotters. A six-level range of projections--from orthographic (side, top, front), to full perspective views--can be generated quickly by computer from a single data set (Fetter 1964). This technique may provide ways in which views and perspectives as well as tonalities, colors, and other characteristics might be described empirically.

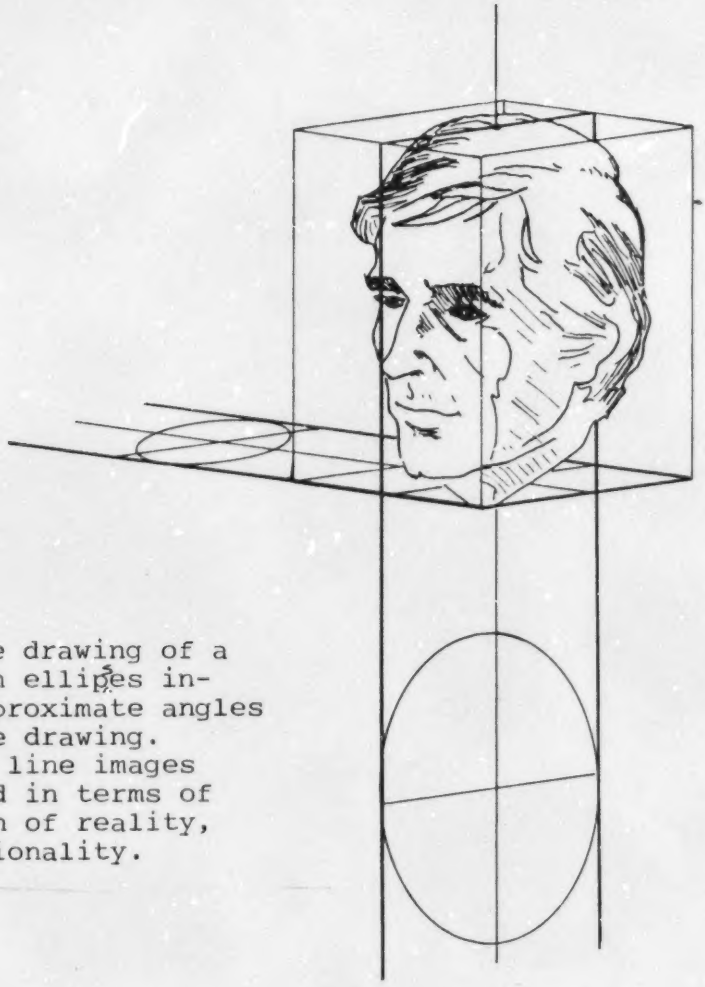


Fig. 12. A line drawing of a man's head, with ellipses indicating the approximate angles suggested by the drawing. Photographic or line images can be evaluated in terms of their suggestion of reality, or three-dimensionality.

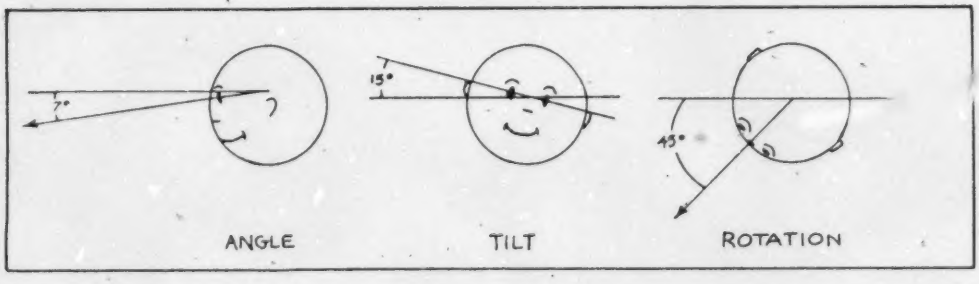


Fig. 13. Actual measurements of the figure above show the 7-degree downward angle (Z axis), the 15-tilt (Y axis), and the 45-degree rotation (X axis) of the head implied by the manner in which it is drawn.

Toward a Model of Manifest Content

It should again be pointed out that the variables proposed herein, and their possible measures, are assumed to be largely independent of the message content of individual graphic elements. Density measures of typographic elements are in no way subject to the wording of a headline, as long identical words are used in each measure, nor does the color of a photograph necessarily depend upon its specific subject matter in a larger sense.

The following preliminary model takes into account manifest, explicitly physical elements in a visual message and attempts to show how one might view these elements and other, nonvisual aspects in concert rather than in isolation. It acknowledges the presence of implicit, content-related variables and other influences which are of great importance but often difficult to measure.

Kaplan (1964) has said that a failing of models and their builders is an "undue emphasis on exactness and rigor." Certainly, no real precision is implied for the following model. It is conceptual in nature, and techniques of measuring many of the variables remain to be developed fully. Ideally, it is intended to have heuristic value, presenting but one way in which researchers might view both implicit and explicit elements of graphic communications. Figure 14 presents a preliminary expression of the Manifest Content Model. The model is suggested to account for purely physical, readily measured elements in a specific visual message, as well as the many influences which help shape that message. It proposes

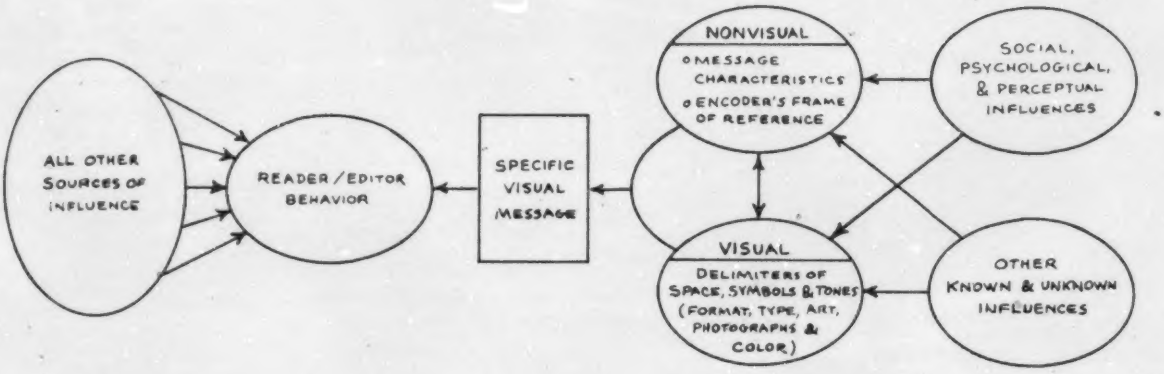

ALL OTHER SOURCES OF INFLUENCE
READER / EDITOR BEHAVIOR
SPECIFIC VISUAL MESSAGE
NONVISUAL
o MESSAGE CHARACTERISTICS
o ENCODER'S FRAME OF REFERENCE
SOCIAL, PSYCHOLOGICAL, & PERCEPTUAL INFLUENCES
VISUAL
DELIMITERS OF SPACE, SYMBOLS & TONES (FORMAT, TYPE, ART, PHOTOGRAPHS & COLOR)
OTHER KNOWN & UNKNOWN INFLUENCES

Fig. 14. The Manifest Content Model

that both visual and nonvisual phenomena help shape one another, having previously been shaped themselves by a number of outside influences. They proceed to generate a specific visual message that reflects all influences impinging upon it.

Criterion behavior of either readers or editors or both is affected by the specific message, but such behavior is also dependent upon a great number of additional outside influences.

This paper, of course, is concerned primarily with the visual delimiters of space, symbols and tonalities suggested in the model, but expression of the many influences which affect these delimiters is useful in putting manifest variables into larger perspective.

A notation for the model follows, patterned after that of a model of complex behavior by McNeil, Kelly and McNeil (1975):

$$Y = f\left[SPP\ (N,V) + Oth\ (N,V)\right] + \left[O\right]$$

Where:

Y = the criterion behavior of readers or editors

f = the functional relationship of the variables

SPP = social, psychological and perceptual influences

N = nonvisual characteristics

V = visual characteristics

KU = other known and unknown influences indirectly affecting the specific visual message

and

O = all other influences unrelated to the specific visual message, but affecting reader or editor behavior

The criterion, or dependent variable (Y) in the model might be any one or several of a number used by researchers in describing the myriad effects of graphic communications:

*depth, speed, ease, or maintenance of interest in reading;

*judgment of reading difficulty;

*aesthetic appreciation, preference, recognition or imitation;

*influence in acceptance, recognition, or purchase;

*efficiency of information transmission, synthesis, or inspiration;

*meaning extraction;

*opinion or attitude change, or

*fulfillment of objectives, and action initiation.

Table 1 summarizes independent variables in the set V (visual delimiters) and their possible measures:

TABLE 1

SELECTED MANIFEST CONTENT VARIABLES
AND THEIR POSSIBLE MEASURES

Variable Type	Measurement	Unit of Measurement
Format	a. total page area	sq. inches, picas, lines, or mm.
	b. width-to-depth ratio	ratio expression
	c. grid size, increment	inches, picas, lines or mm.
	d. general parameters	inches, picas, lines, or mm.
	e. specific parameters	inches, picas, lines, or mm.
Typographic	f. size	percentage values
	g. weight	density values
	h. force of stress	angle, in degrees
	i. presence of serifs	discrete value(1,0)
	j. texture	percentage values
Photo-Art	k. total area	sq. inches, picas, or mm.
	l. width-to-depth ratio	ratio expression
	m. density	percentage values
	n. hue, value, chroma	Munsell values
	o. recession/advancement	user-defined scale
	p. lines of force	user-defined scale
	q. projection level	6-level projection scale

Value of the Model

This paper presents only the beginnings of a conceptual model to account for content-neutral (manifest) variables in graphics research. The major benefit intended for the model is possible identification and quantification of variables not previously used. Expression of variables as continuous scores or values rather than as nominal units seems to suggest multivariate analysis. One might, for instance, hypothesize an additive relationship between selected variables--photograph size as a ratio of total page area, headline density, and predominant direction of photographic lines of force--as they affect reader preference for particular layouts. If the researcher could add to the equation variables relating to message content or perceptual theory, so much the better. Tests of the equation would indicate the proportion of criterion variance accounted for by both visual and other predictors.

A secondary but important consideration is the possible development of a unified system of classifying graphic elements that will enable researchers to reconcile their findings with all others in a systematic fashion.

The purpose of visual as well as verbal literacy, says Dondis (1973), is "to construct a basic system for learning, recognizing, making, and understanding visual messages that are negotiable by all people, not just those specially trained, like the designer, the artist, the craftsman, and the aesthetician."

REFERENCES

Benton, Camille L. "The Connotative Dimensions of Selected Display Typefaces." Houston: Association for Education in Journalism Annual Convention. August, 1979.

Culbertson, Hugh M. "Basic Research in Visual Communication: iconicity." Lawrence: Association for Education in Journalism Annual Convention. August, 1968.

Dondis, Donis A. A PRIMER OF VISUAL LITERACY. Cambridge: The MIT Press, 1973.

Fetter, William A. COMPUTER GRAPHICS IN COMMUNICATION. New York: McGraw-Hill Book Company, 1964.

Gibson, James J. "A Theory of Pictorial Perception." AUDIO-VISUAL COMMUNICATIONS REVIEW. 2 (1954), 3-23.

Gropper, George L. "Why Is a Picture Worth a Thousand Words." AUDIO-VISUAL COMMUNICATIONS REVIEW. 11 (1963), 75-95.

Hazard, William. "Responses to News Pictures: A Study in Perceptual Unity." JOURNALISM QUARTERLY. 37 (Fall, 1960), 515.

Hochberg, Julian. "The Psychophysics of Pictorial Perception." AUDIO-VISUAL COMMUNICATIONS REVIEW. 10 (1962), 215.

Hurlburt, Allen. PUBLICATION DESIGN. New York: Van Nostrand Reinhold Company, 1976.

Hurlburt, Allen. THE GRID: A MODULAR SYSTEM FOR THE DESIGN AND PRODUCTION OF NEWSPAPERS, MAGAZINES, AND BOOKS. New York: Van Nostrand Reinhold Company, 1978.

Hvistendahl, J.K. "The effect of typographic variants on magazine pages." Syracuse: Association for Education in Journalism Annual Convention. August, 1965.

Kaplan, Abraham. THE CONDUCT OF INQUIRY. San Francisco: Chandler Publishing Company, 1964.

Lieberman, J. Ben. TYPES OF TYPEFACES AND HOW TO RECOGNIZE THEM. New York: Sterling Publishing Co., Inc., 1967.

McNeil, Keith; Kelly, Francis J.; and McNeil, Judy T. TESTING RESEARCH HYPOTHESES USING MULTIPLE LINEAR REGRESSION. Carbondale: Southern Illinois University Press, 1975.

Mehling, Reuben. "Attitude Changing Effect of News and Photo Combinations." JOURNALISM QUARTERLY. 36 (Spring, 1959).

PRINTING IMPRESSIONS (cover) (December, 1979).

Schramm, Wilbur. "The Nature of News." JOURNALISM QUARTERLY. 26 (1949).

Selltiz, Claire; Jahoda, Marie; Deutsch, Morton; and Cook, Stuart. RESEARCH IN SOCIAL RELATIONS. New York: Holt, Rinehart and Winston, 1959.

Siskind, Theresa. "The Effect of Newspaper Design on Reader Preference." JOURNALISM QUARTERLY. 56 (Spring, 1979).

Strauss, Victor. THE PRINTING INDUSTRY. New York: R. R. Bowker Company, 1967.

Swanson, Charles. "What they Read in 130 Daily Newspapers." JOURNALISM QUARTERLY. 32 (Summer, 1955).

Tannenbaum, P.H.; Jacobson, H.K.; and Norris, E.L. "An Experimental Investigation of Typefaces." JOURNALISM QUARTERLY. 41 (1964).

Tinker, Miles. LEGIBILITY OF PRINT. Ames: Iowa State University Press, 1963.

Turnbull, Arthur T., and Baird, Russell N. THE GRAPHICS OF COMMUNICATION (4th ed.). New York: Holt, Rinehart and Winston, 1980.

Woodburn, Bert W. "Reader Interest in News Pictures." JOURNALISM QUARTERLY. 24 (Autumn, 1947).

Wright, W.D. THE MEASUREMENT OF COLOR. London: Adam Hilger Ltd., 1969.

Wrolstad, M.E. "Adult Preferences in Typography: Exploring the Function of Design." JOURNALISM QUARTERLY. 37 (1960).

Zapf, Hermann. "The Changes in Letterforms Due to Technical Developments." THE JOURNAL OF TYPOGRAPHIC RESEARCH. II. (October 1968).